[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0384; Project Identifier AD-2022-00027-E]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede Airworthiness Directive (AD) 2021-14-06, which applies to all Pratt & Whitney (PW) PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines. AD 2021-14-06 requires repetitive borescope inspections (BSI) of certain low-pressure compressor (LPC) rotor 1 (R1) until replacement of electronic engine control (EEC) full authority digital electronic control (FADEC) software with updated software. AD 2021-14-06 also requires a BSI after installation of the updated EEC FADEC software if certain Onboard Maintenance Message fault codes are displayed and meet specified criteria. AD 2021-14-06 also requires, depending on the results of the BSI, replacement of the LPC R1. Since the FAA issued AD 2021-14-06, the manufacturer redesigned the compressor intermediate case (CIC) assembly to incorporate a shortened bleed duct configuration and updated the EEC FADEC software. This proposed AD would continue to require repetitive BSI of certain LPC R1s until replacement of EEC FADEC software with updated software and also a BSI after installation of the updated EEC FADEC software if certain Onboard Maintenance Message fault codes are displayed and meet specified criteria. This proposed AD would continue to require, depending on the results of the BSI, replacement of the LPC R1. This proposed AD would also require removal and replacement of the existing CIC assembly with a CIC assembly eligible for installation. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

• Federal eRulemaking Portal: Go to https://www.regulations.gov. Follow the instructions for submitting comments.

• Fax: (202) 493-2251.

• Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

• Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Pratt & Whitney, 400 Main Street, East Hartford, CT, 06118; phone: (800) 565-0140; email: help24@pw.utc.com; website: http://fleetcare.pw.utc.com. You may view this service information at the Airworthiness Products Section, FAA, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

Examining the AD Docket

You may examine the AD docket at https://www.regulations.gov by searching for and locating Docket No. FAA-2022-0384; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Mark Taylor, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7229; email: Mark.Taylor@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include "Docket No. FAA-2022-0384; Project Identifier AD-2022-00027-E" at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend the proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to https://www.regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Mark Taylor, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2021-14-06, Amendment 39-21633 (86 FR 36061, July 8, 2021), (AD 2021-14-06), for all PW PW1519G, PW1521G, PW1521G-3, PW1521GA,

PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines. AD 2021-14-06 was prompted by reports of in-flight shutdowns due to failure of the LPC R1 and by subsequent findings of cracked LPC R1s during inspection. Additionally, the manufacturer performed further root cause analysis of the LPC R1 failures and determined the need to update the EEC FADEC software to automate rotor speed management and limit the maximum climb and maximum continuous thrust ratings. AD 2021-14-06 requires repetitive BSIs of certain LPC R1s until replacement of EEC FADEC software with the updated software, and a BSI after installation of the updated EEC FADEC software if certain Onboard Maintenance Message fault codes are displayed and meet specified criteria. AD 2021-14-06 also requires, depending on the results of the BSI, replacement of the LPC R1. The agency issued AD 2021-14-06 to prevent failure of the LPC R1.

Actions Since AD 2021-14-06 Was Issued

Since the FAA issued AD 2021-14-06, the manufacturer performed further analysis and determined the need for corrective action. The manufacturer redesigned the CIC assembly to incorporate a shortened bleed duct configuration. The shortened bleed duct will address the unsafe condition by preventing the coincidence between bleed and the acoustic excitation. The manufacturer also updated the EEC FADEC software to provide compatibility with both current and future operation of engines and airplanes with the redesigned CIC assembly installed.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Related Service Information

The FAA reviewed PW Service Bulletin (SB) PW1000G-A-73-00-0025-00B-930A-D, Issue No. 001, dated November 23, 2021; PW SB PW1000G-A-72-00-0125-00A-930A-D, Issue No. 004, dated October 13, 2021; PW SB PW1000G-A-72-00-0075-00B-930A-D, Issue No. 004, dated July 21, 2021; PW SB PW1000G-A-73-00-0052-00A-930A-D, Issue No. 001, dated October 7, 2021; PW SB PW1000G-A-72-00-0121-

00B-930A-D, Issue No. 001, dated July 9, 2021; PW SB PW1000G-A-72-00-0175-00A-930A-D, Issue No. 001, dated July 1, 2021.

PW SB PW1000G-A-73-00-0025-00B-930A-D, Issue No. 001, dated November 23, 2021, describes procedures for replacing or modifying the EEC to incorporate EEC FADEC software version V9.6.5.6 in PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines. PW SBs PW1000G-A-72-00-0125-00A-930A-D, Issue No. 004, dated October 13, 2021, and PW1000G-A-72-00-0075-00B-930A-D, Issue No. 004, dated July 21, 2021, describe procedures for performing repetitive BSIs of LPC R1s. PW SB PW1000G-A-73-00-0052-00A-930A-D, Issue No. 001, dated October 7, 2021, describes procedures for replacing or modifying the EEC to incorporate EEC FADEC software version V2.11.12 in PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, PW1525G-3 model turbofan engines. PW SBs PW1000G-A-72-00-0121-00B-930A-D, Issue No. 001, dated July 9, 2021, and PW1000G-A-72-00-0175-00A-930A-D, Issue No. 001, dated July 1, 2021, describe procedures for replacing or modifying the CIC assembly.

The FAA also reviewed Section PW1000G-A-72-00-00-02A-0B5A-A of PW engine maintenance manual (EMM), Issue No. 016, dated January 15, 2021; and Section PW1000G-A-72-31-00-00A-312A-D of PW EMM, Issue No. 017, dated March 19, 2021. Section PW1000G-A-72-00-00-02A-0B5A-A of PW EMM, Issue No. 016, dated January 15, 2021, describes procedures for inspecting the engine for possible engine damage after receiving notification of an N1 or N2 overspeed operation. Section PW1000G-A-72-31-00-00A-312A-D of PW EMM, Issue No. 017, dated March 19, 2021, describes procedures for performing a BSI of the LPC.

Proposed AD Requirements in this NPRM

This proposed AD would retain certain requirements of AD 2021-14-06. This proposed AD would continue to require removal from service of certain EEC FADEC software and the installation of a software version eligible for installation. This proposed AD would require a BSI of LPC R1 for damage and cracks after replacing certain EEC FADEC software versions and would continue to require a BSI of LPC R1 after installation of an eligible EEC FADEC software version if certain Onboard Maintenance

Message fault codes are displayed and meet specified criteria. This proposed AD would continue to require, depending on the results of the BSI, replacement of the LPC R1. This proposed AD would also require removal and replacement of certain CIC assemblies, identified by part number, with a CIC assembly eligible for installation.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 114 engines installed on airplanes of U.S. registry. The FAA estimates that five percent of engines installed on airplanes of U.S. registry would require BSI of the LPC R1, as proposed in paragraph (g)(3) of this AD, after installation of the EEC FADEC software version eligible for installation.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Replace EEC FADEC software	2 work-hours x $85 per hour = $170	$0	$170	$19,380
BSI of the LPC R1	2 work-hours x $85 per hour = $170	$0	$170	$969
Replace CIC assembly	428 work-hours x $85 per hour = $36,380	$124,522	$160,902	$18,342,828

The FAA estimates the following costs to do any necessary inspection if certain Onboard Maintenance Message fault codes are displayed or if any necessary replacement would be required based on the results of the proposed inspection. The agency has no way of determining the number of aircraft that might need these replacements or inspections:

On-condition costs

Action	Labor Cost	Parts Cost	Cost per product
Replace LPC R1	40 work-hours x $85 per hour = $3,400	$156,000	$159,400
BSI of the LPC R1 if Onboard Maintenance	2 work-hours x $85 per hour = $170	$0	$170

Message fault codes are displayed and meet specified criteria			

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this proposed AD may be covered under warranty, thereby reducing the cost impact on affected individuals.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Would not affect intrastate aviation in Alaska, and

(3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

a. Removing Airworthiness Directive 2021-14-06, Amendment 39-21633 (86 FR 36061, July 8, 2021); and

b. Adding the following new airworthiness directive:

Pratt & Whitney: Docket No. FAA-2022-0384; Project Identifier AD-2022-00027-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2021-14-06, Amendment 39-21633 (86 FR 36061, July 8, 2021).

(c) Applicability

This AD applies to Pratt & Whitney PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by reports of in-flight shutdowns due to failure of the low-pressure compressor (LPC) rotor 1 (R1) and by subsequent findings of cracked LPC R1s during inspection. The FAA is issuing this AD to prevent failure of the LPC R1. The unsafe condition, if not addressed, could result in an uncontained release of the LPC R1, damage to the engine, damage to the airplane, and loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, and PW1525G-3 model turbofan engines with installed electronic engine control (EEC) full authority digital electronic control (FADEC) software earlier than EEC FADEC software version V2.11.10.4, before further flight, remove the EEC FADEC software and install EEC FADEC software version eligible for installation.

(2) For PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines with installed EEC FADEC software earlier than EEC FADEC software version V9.5.6.7, before further flight, remove the EEC FADEC software and install EEC FADEC software version eligible for installation.

(3) For the model turbofan engines identified in paragraphs (g)(1) and (g)(2) of this AD, after installation of the EEC FADEC software version eligible for installation as required by paragraphs (g)(1) and (g)(2) of this AD, before further flight, perform a one-time borescope inspection (BSI) of the LPC R1 for damage and cracks at the following LPC R1 locations:

(i) The blade tip;

(ii) The leading edge;

(iii) The leading edge fillet to rotor platform radius; and

(iv) The airfoil convex side root fillet to rotor platform radius.

(4) Based on the results of the BSI required by paragraph (g)(3) of this AD, before further flight, remove and replace the LPC R1 if:

(i) There is damage on an LPC R1 that exceeds serviceable limits; or

(ii) Any crack in the LPC R1 exists.

Note 1 to paragraph (g)(4): Guidance on determining the serviceable limits in paragraphs (g)(4) and (6) of this AD can be found in Pratt & Whitney (PW) Service Bulletin (SB) PW1000G-A-72-00-0125-00A-930A-D, Issue No. 004, dated October 13, 2021, and PW SB PW1000G-A-72-00-0075-00B-930A-D, Issue No. 004, dated July 21, 2021.

(5) For PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, and PW1525G-3 model turbofan engines with EEC FADEC software version V2.11.10.4 or later installed, within 15 flight cycles after receipt of Onboard Maintenance Message fault code 7100F0029 or 7100F0030, perform a BSI of the LPC R1 for damage and cracks at the locations specified in paragraph (g)(3) of this AD if the fault code is displayed on the Active Failure Messages and meets the following criteria:

(i) N1 Exceedance is above 95.2%;

(ii) N1 Exceedance occurred above 29,100 feet;

(iii) N1 Exceedance occurs for a duration of 40 seconds (15 seconds of cockpit display) or more during any flight; and

(iv) Compressor intermediate case (CIC) assembly installed has part number (P/N) 5379926, P/N 5379940, P/N 5379946, or P/N 5379926-001.

Note 2 to paragraph (g)(5): Guidance on determining the N1 Exceedance duration can be found in Section PW1000G-A-72-00-00-02A-0B5A-A of PW engine maintenance manual (EMM), Issue No. 016, dated January 15, 2021.

Note 3 to paragraph (g)(5): Guidance on performing the BSI can be found in Section PW1000G-A-72-31-00-00A-312A-D of PW EMM, Issue No. 017, dated March 19, 2021.

(6) Based on the results of the BSI required by paragraph (g)(5) of this AD, before further flight, remove and replace the LPC R1 if:

(i) There is damage on an LPC R1 that exceeds serviceable limits; or

(ii) Any crack in the LPC R1 exists.

(7) For all affected model turbofan engines, at the next engine shop visit after the effective date of this AD, remove CIC assembly with P/N 5379926, P/N 5379940, P/N 5379946, or P/N 5379926-001 and replace with a CIC assembly eligible for installation.

(8) For PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, and PW1525G-3 model turbofan engines with installed EEC FADEC software version V2.11.10.4, at the next engine shop visit after the effective date of this AD, remove the EEC FADEC software and install EEC FADEC software version eligible for installation.

(9) For PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines with installed EEC FADEC software version V9.5.6.7, at the next engine shop visit after the effective date of this AD, remove the EEC FADEC software and install EEC FADEC software version eligible for installation.

(h) Definitions

(1) For the purpose of this AD, "EEC FADEC software version eligible for installation" is EEC FADEC software version V2.11.12.4 or later for PW1519G, PW1521G, PW1521G-3, PW1521GA, PW1524G, PW1524G-3, PW1525G, and PW1525G-3 model turbofan engines, and EEC FADEC software version V9.6.5.6 or later for PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A model turbofan engines.

(2) For the purpose of this AD, an "engine shop visit" is the induction of an engine into the shop for maintenance involving the separation of the LPC Flange 1 or separation of the LPC Flange 4, except for the following situations, which do not constitute an engine shop visit.

(i) Separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance.

(ii) Separation of engine flanges solely for the purpose of replacing the fan without subsequent maintenance.

(3) For the purpose of this AD, a "CIC assembly eligible for installation" is any CIC assembly that does not have P/N 5379926, P/N 5379940, P/N 5379946, or P/N 5379926-001.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (j)(1) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

(1) For more information about this AD, contact Mark Taylor, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7229; email: Mark.Taylor@faa.gov.

(2) For service information identified in this AD, contact Pratt & Whitney, 400 Main Street, East Hartford, CT, 06118; phone: (800) 565-0140; email: help24@pw.utc.com; website: http://fleetcare.pw.utc.com.

(3) You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

Issued on March 25, 2022.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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